

ROBOTIC CONVERSION IN LIVER SURGERY

Name of Center and surgeon filling out survey:

1. How many (n°) robotic liver resections have you performed in your entire experience?

2. How many (n°) laparoscopic liver resections?

3. How many (n°) RoboLap liver resections?

4. How many (n°) open liver resections?

5. When did you start performing robotic liver surgery?

- ☐ before 2010
- ☐ 2011
- ☐ 2012
- ☐ 2013
- ☐ 2014
- ☐ 2015
- ☐ 2016
- ☐ 2017
- ☐ 2018
- ☐ 2019
- ☐ 2020
- ☐ 2021
- ☐ 2022
- ☐ 2023
- ☐ 2024

6. What is the annual volume (n° cases/year) of robotic liver surgery performed at your center ?

7. Who are usually your assistants at tableside for robotic major hepatectomy?

- ☐ surgeons,
- ☐ residents,
- ☐ fellows,
- ☐ first assistant,
- ☐ nurse,
- ☐ other _____

8. Who are usually your assistants at tableside for robotic minor hepatectomy?

- ☐ surgeons,
- ☐ residents,
- ☐ fellows,
- ☐ first assistant,
- ☐ nurse,
- ☐ other_____

9. How many open conversions have you performed for any reason during robotic liver resection?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ >10

10. How many conversions to laparoscopic approach have you performed during robotic liver resection?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ >10

11. How many unplanned conversions have you performed in your first 100 robotic liver resections? And how many conversions after your first 100 cases?

12. How many emergency conversions due to bleeding?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

- ☐ 8
- ☐ 9
- ☐ 10
- ☐ >10

13. What are the most common causes of unplanned conversion?

- ☐ Bleeding
- ☐ Oncological reason (vascular cancer involvement)
- ☐ Difficult tumor location (posterior segments, caudate lobe, etc.)
- ☐ Visceral obesity
- ☐ Presence of dense adhesions
- ☐ Intraoperative anesthesia-related issues
- ☐ Other _____

IN CASE OF EMERGENCY CONVERSION DUE TO BLEEDING

HOW DO YOU MANAGE IT? STEP 1 (TEMPORARY CONTROL)

14. How do you preferably manage active bleeding?

- ☐ Immediate conversion
- ☐ Temporary control with robotic grasper prior to conversion
- ☐ Temporary control with laparoscopic grasper prior to conversion
- ☐ Temporary control with direct suturing,
- ☐ Temporary control with robotic bulldogs,
- ☐ Temporary control with laparoscopic bulldogs,
- ☐ sponge,
- ☐ pringle maneuver,
- ☐ other _____

15. How long do you attempt hemostasis before deciding to convert?

- ☐ after 50 cc blood loss,
- ☐ after 200 cc blood loss,
- ☐ after 500 cc blood loss,
- ☐ after >800 cc

HOW DO YOU MANAGE IT? STEP 2 (UNDOCKING)

16. Do you do complete or partial undocking?

- ☐ complete undocking
- ☐ partial undocking
- ☐ it depends (specify)

17. If PARTIAL undocking, which robotic arm/s do you leave inside the abdomen during laparotomy?

- ☐ arm 1
- ☐ arm 2 (+/- camera)
- ☐ arm 3 (+/- camera)
- ☐ arm 4

18. When do you remove camera?

- ☐ before laparotomy,

- ☐ during laparotomy,
- ☐ upon entering the abdomen

HOW DO YOU MANGE IT? STEP 3 (LAPAROTOMY)

19. Who usually perform the laparotomy?

- ☐ table side team,
- ☐ console surgeon,
- ☐ other surgeon,
- ☐ other _____

20. What type of incision did you perform?

- ☐ median,
- ☐ tranverse,
- ☐ inverted L,
- ☐ other _____

21. How long does it take you to perform an emergency laparotomy?

- ☐ 1-3 min,
- ☐ 4-6 min,
- ☐ >6 min

HOW DO YOU MANGE IT? STEP 4 (DEFINITIVE CONTROL OF BLEEDING)

22. What was the origin of bleeding in your cases?

- ☐ Intrahepatic vessel branches
- ☐ Extrahepatic portal vein
- ☐ Extrahepatic artery
- ☐ Gastroduodenal artery
- ☐ Inferior vena cava
- ☐ other _____

23. How do you mainly solve bleeding?

- ☐ direct suturing,
- ☐ ligation
- ☐ interposition of vascular graft,
- ☐ patch,
- ☐ application of energy,
- ☐ other _____

24. How long does it take you to definitely control the bleeding (from the decision to convert)?

- ☐ <5 min,
- ☐ 5-10 min,
- ☐ >10 min

25. What do you think the training for potential conversion should be?

- ☐ Periodic simulation
- ☐ Online lecture
- ☐ Classroom lecture
- ☐ other _____

26. Who should be trained for potential conversion?

- ☐ Main surgeon
- ☐ Main surgeon + Table side surgeons
- ☐ Main surgeon + Table side surgeons + Nurses
- ☐ Main surgeon + Table side surgeons + Nurses + Anesthesiologist
- ☐ other _____

27. What non-robotic instruments do you routinely open during robotic major hepatectomy?

- ☐ Minor laparotomy instruments
- ☐ Major laparotomy instruments
- ☐ Laparoscopic instruments
- ☐ other _____

28. What non-robotic instruments do you routinely open during robotic minor hepatectomy?

- ☐ Minor laparotomy instruments
- ☐ Major laparotomy instruments
- ☐ Laparoscopic instruments
- ☐ other _____

29. How did you feel (from a scale 1-10) being upset leading/contributing to conversion?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

30. How did you feel (from a scale 1-10) being disappointed leading/contributing to conversion?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

31. How did you feel (from a scale 1-10) being stressed leading/contributing to conversion?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8

- ☐ 9
- ☐ 10

32. How did you feel (from a scale 1-10) being fatigued leading/contributing to conversion?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

33. How did you feel (from a scale 1-10) being worried leading/contributing to conversion?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

34. Do you think the rest of team feel the same?

- ☐ Yes
- ☐ No
- ☐ Maybe
- ☐ other_____

35. Do you feel the unplanned conversion affect your performance for the following operations?

- ☐ Yes
- ☐ No

36. If Yes, specify how the conversion affect your performance or mental state.

37. Do you have a formal protocol for unplanned conversion in your center at this time?

- ☐ Yes
- ☐ No

38. Do you think there is need to create a formal protocol for unplanned conversion?

- ☐ Yes
- ☐ No

39. Do you think a formal protocol for unplanned conversion will improve safety/outcomes?

- ☐ Yes
- ☐ No

40. How do you think the approach to conversion can be improved?
